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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/726,852
Filing Date: November 30, 2000
Appellant(s): COCHRAN ET AL.

Kevin M. Mason
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on 7/27/09 *(and to the originally filed appeal brief on 6/21/07)* appealing from the Office action mailed 2/28/05 and Examiner's Answer filed on 4/18/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest as Hewlett-Packard Development Company, LP is contained in the brief.

(2) Related Appeals and Interferences

The brief indicated no related appeals and interferences, which directly affect or be directly affected by or have a bearing on the decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

- Ito et al. (U.S. Patent No. 6684209), *hereinafter Ito.*

(9) Grounds of Rejection

The following ground(s) of rejection remain applicable to the appealed claims:

Claim Rejections - 35 USC § 102

Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Ito (U.S. Patent No. 6684209).

As per claims 1-3, Ito teaches a storage subsystem 101 with ports 102-104 communicating with host computers 105-107 that have ports 108-112 (col. 8 lines 4 7-58 and Fig. 1). Furthermore, Ito et al. a "LUN Access Management Table", which includes the linkage information combining a LUN (Logical Unit Number) to identify a LUN that exists in the storage subsystem, the WWN (N_PortName) allocated to the host computer which may access the LUN, and the Virtual LUN to decide how to show the LUN to the host computer using the input unit 125 within the maintenance terminal." (Ito, col. 9 lines 20-33).

This reads on an access table that includes entries that each represents authorization of a particular remote entity to access a particular logical unit and a supplemental access table that includes entries that each represents authorization of a particular control device logical unit to access a particular logical unit.

Ito teaches that this Virtual LUN in this table is disclosed to each host computer. The WWN of each host computer is known (Ito, col. 9 lines 31-33). The storage subsystem searches the "LUN Access Management Table" using the WWN obtained as a key and obtains the Virtual LUN corresponding to the LUN that is a target of the Inquiry Command from the "LUN Access Management Table" The reason why the storage subsystem obtains the LUN that is a target of the Inquiry Command as a Virtual LUN is that only the Virtual LUN is disclosed to the host computer. Next, when the storage subsystem finds that the Virtual LUN corresponding to the WWN is actually obtained, i.e. the Virtual LUN corresponding to the WWN does exisl in the "LUN Access Management Table", the host computer is permitted to access the Virtual LUN. When the required Virtual LUN doesn't exist in the Table, the host computer is refused access to the LUN (Ito, col. 9 lines 52-67).

This reads on authorizing the request for execution of the operation only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit.

As per claim 2 and 7, col. 14 lines 5-60 clearly show that authorization steps are conducted by a storage subsystem entity.

As per claim 5 and 10, Ito teaches that the present invention implements a disk array subsystem (col. 15 lines 38-40).

(10) Response to Argument

Terms LUN and CDLUN will be used to represent "logical unit" and "control device logical unit", respectively.

The current Appeal Brief presented by appellant's representative does not number pages. The examiner considers pg. 1 to be the page that indicates "REAL PARTY IN INTEREST".

Appellant's representative questions Ito's disclosure of an "access table" and a "supplemental access table". *It appears that appellant's representative essentially argues three main issues:*

I. *The "access table" and the "supplemental access table" cannot be read as a single table,*

II. *Ito's Supplemental Access Table does not include entries that each represents authorization of a particular CDLUN to access a particular LUN,*

III. *CDLUNs disclosed by Ito are not the same as CDLUNs in appellant's invention.*

Re: I.

In support of the statement that ***an "access table" and a "supplemental access table" cannot be read as a single table*** *appellant's representative asserts that*

> *"when a claim drafter uses two different terms in a claim, it is assumed that the two different terms refer to two different features, entities, or steps".*

Additionally, in regard to the Access Table the appellant's representative recites as follows:

> *"Appellant's representative agrees with the Examiner's statement … Ito does indeed teach a 'LUN access management table,' each entry of which specifies a host-computer port name, a LUN, and a synonym or alias for the LUN, referred to by Ito as a 'virtual LUN.' Appellant's representative agrees with the middle paragraph of page 4 of the Examiner's Answer, in which the Examiner describes authorization of a host computer to access a particular LUN based on Ito's 'LUN Access Management Table.' " (the current Appeal Brief, pg. 7)*

and adds

> *"Ito's 'LUN Access Management Table' is quite similar, in structure and use, to the access table referred to in the first element of claim 1 and described in the current application, with the exception that Ito provides aliases, or synonyms, for the physical LUN in each of Ito's LUN-Access-Management-Table entry. However, nowhere in Ito, or in the Examiner's summaries, are CDLUNs mentioned, nowhere in Ito is there mention of any kind of table that authorizes access of LUNs of the storage subsystem by other LUNs of the storage system, and nowhere in Ito is there a description or suggestion of a two-part access authorization involving two different tables containing access authorization information" (the current Appeal Brief, pg. 7-8).*

For clarity purposes, at this point the examiner wishes to address applicant newly presented argument that an "access table" and a "supplemental access table" cannot be read as a single table.

The indication of authorization of a specified CDLUN to access to additional specified LUN will be addressed in Re: II.

The examiner points out that tables are structures characterized by rows and columns (See Microsoft Press Computer Dictionary, for example). In fact a structure with one row and several columns is a table, as it is a structure comprising one column and several rows.

For intuitive example, the examiner refers to operation of a Microsoft Word application that enables a user to insert tables into a word document. Upon selecting *Table* from the menu option followed by *Insert* option and then *Table* option, Microsoft Word application urges a user to select a value representing the desired number of columns and rows that the inserted table will have. Selecting number 0 will warn a user that a table column (or a row) must have a value greater than 0 (between 1 and 63, as suggested by Microsoft Word, for example).

Fig. 14 of Ito can be considered as two tables merged together. The evidence of such interpretation (besides the arguments presented above) additionally is supported by Fig. 21 of Ito. Fig. 14 shows a "composite" table having a plurality of columns (WWW;

Virtual LUN and LUN) and a set of rows (1402 to 1414). Fig. 21, on the other hand, shows two separate tables, namely as "WW-S_ID Conversion Table" having only 2 columns (SID and WWN) and a "LUN Access Management Table".

In addition to such an interpretation "LUN Access Management Table" object in Fig. 21 may be considered as comprising several tables. Column 1415 comprising a set of rows 1402 to 1414 may be considered as table 1, and columns 1416 and 1417 with rows a set of rows 1402 to 1414) may be considered as table 2, for example. Columns 1415 and 1416 with rows 1402 to 1414 can be considered as another table.

The examiner points out that making entities integral or separable without affecting functionalities of the combinations is well known and acknowledged (*In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965)* and *In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961)*, for example), and indeed an ordinary artisan would realize that different logical tables disclosed by Ito could easily be *physically* separated in order to create a multi dimensional database, which appears to be applicant's intended (but not claimed) interpretation of the claim language.

Nevertheless, Ito's Access Table and Supplemental Access disclosed in Fig. 21, are not the same single table. The Access Table and Supplemental Access Table in Ito's reference are different tables representing different relationships.

Fig. 21 discloses an Access Table *(in "LUN Access Management Table" object)* that comprises columns with entries indicating a CDLUN (Virtual LUN), a port and a remote entity (2105), to be an Access Table.

A table (in Fig. 21) comprising columns with entries indicating a LUN (LUN) and CDLUN (Virtual LUN), to be a Supplemental Access Table.

Note, that the above interpretations are consistent with appellant's claim language (see claims 3 and 4).

Lastly, note that additional interpretation of Fig. 21 would also be a correct in light of appellant's claimed limitations and also would read on two different tables. Specifically, note "WWN-S_ID Conversion Table" (that indicates a port and a remote entity and CDLUN: *(Virtual LUN)*), which meets limitations of an Access Table, and "LUN Access Management Table" (that indicates CDLUN *(Virtual LUN)* and LUN), which meets limitations of a Supplemental Access Table, would also be a correct interpretation in light of appellant's claimed limitations.

Summarizing, Ito's invention clearly discloses an Access Table and a Supplemental Access Table.

Re: II.

To support an assertion that ***Ito's Supplemental Access Table does not include entries that each represents authorization of a particular CDLUN to access a particular LUN*** *appellant's representative argues:*

> *"The third element of claim 1 specifies that, 'when a remote entity requests execution of an operation directed to a specified control device logical unit and involving one or more additional specified logical units,' then the request for execution of the operation is authorized 'only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit.' "*

and

> *"The above-quoted conclusory paragraph does not follow from anything in Ito or even from the Examiner's summary of Ito in the last paragraph of page 3 of the Examiner's Answer and in the middle paragraph of page 4 of the Examiner's Answer. Ito describes a single "LUN Access Management Table" with entries that each authorize a port of a host computer to access a single LUN provided by Ito's storage subsystem. In other words, Ito's "LUN Access Management Table" is quite similar, in structure and use, to the access table referred to in the first element of claim 1 and described in the current application, with the exception that Ito provides aliases, or synonyms, for the physical LUN in each of Ito's LUN- Access-Management-Table entry. However, nowhere in Ito, or in the Examiner's summaries."*

As shown above, Ito discloses a Supplemental Access Table that includes entries of indicating a CDLUN and indicating a LUN.

Thus, at this point, the examiner would like to discuss the particular limitations of claim 1 and 6, argued by appellant's representative:

… **when a remote entity requests execution of an operation directed to a specified CDLUN and involving one or more additional specified LUN,** …

Ito teaches a storage subsystem 101 with ports 102-104 communicating with host computers 105-107 that have ports 108-112 (col. 8 lines 4 7-58, Fig. 1 and 16) and it is clear from Fig. 13 and 16, for example, that the operations are directed to a specified CDLUN (e.g. objects 1607: Virtual LUs 0, 1, 2, etc.) and involving one or more additional specified LUN (e.g. objects 1608, LUs 0, 1, 2, etc.).

… **authorizing the request for execution of the operation only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified CDLUN,** and …

Ito's Fig. 21 discloses the linkage information combining a LUN to identify a LUN that exists in the storage subsystem, the WWN (N_PortName) allocated to the remote host which may access the LUN, and the CDLUN to decide how to show the LUN to the host computer using the input unit 125 within the maintenance terminal." (Ito, col. 9 lines 20-33). Note that the concept of linking of a remote entity with a particular CDLUN, which allows the remote entity to access the particular CDLUN is clearly illustrated in Fig. 21. For example, if the Access Table disclosed by Ito consisted only of entries disclosed in Fig. 21, the particular requesting remote entity would not be able to

access CDLUNs other than 0, 1 and 2 (see Fig. 21). However, other remote hosts could be authorized to additional CDLUNs, for example 0, 1, 2 and 3, as shown in 1402's row of Fig. 14.

Summarizing, it is clear that in Ito's invention, when a remote entity requests execution of an operation directed to a specified CDLUN and involving one or more additional specified LUN, the request for execution of the operation is authorized only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified CDLUN.

... for each of the one or more additional specified LUN, an entry exists in the Supplemental Access Table that represents authorization of the specified CDLUN to access to additional specified LUN.

Similarly, to Access Table entries discussed above, the Supplemental Access Table includes entries of LUNs and corresponding CDLUNs that the LUNs can access. For example, CDLUN 1 disclosed in Fig. 21 can access LUN 17 but it will not be able to access LUN 20. However, CDLUN 16 disclosed in Fig. 14 is authorized to access LUN 20.

In other words, in order to grant a remote host execution request to access a particular resources stored on a particular LUN, in addition to an entry Access Table representing authorization of the remote entity to access the specified CDLUN, an entry representing

authorization of the particular CDLUN to access a particular LUN must be present in a Supplemental Access Table.

Summarizing, in Ito's invention for each of the one or more additional specified LUN, an entry exists in the Supplemental Access Table that represents authorization of the specified CDLUN to access to additional specified LUN.

Re: III.

To support an assertion that ***CDLUNs disclosed by Ito are not the same as CDLUNs in appellant's invention****, appellant's representative argues that CDLUN is a term of art well known to those skilled in the art, which does not correspond to a physical LUN, but instead provides a means for host computers to direct multi-LUN operations to a disk array or other mass-storage device. Appellant's representative rejects the notion that CDLUN is equivalent to Ito's virtual LUN and argues that there is one-to-one mapping between virtual LUN and real LUNs in Ito's storage subsystem and emphasizing that "Ito's virtual LUNs have absolutely nothing whatsoever to do with control device logical units or CDLUNs".*

The examiner points out that Ito's virtual LUN reads on CDLUN. The examiner is not sure how appellant's representative derived the conclusion that CDLUN (virtual LUN) disclosed by Ito is equivalent to a physical LUN. The term "virtual" is well known in the art of computer science and does not mean "physical". For example, to use more

intuitive example, virtual memory used in a personal computer is not the same as physical memory of the computer. Similarly, the term "virtual" in Ito's invention does not mean "physical". See Ito's col. 7 lines 28-30 ("a virtual area which is divided in plural areas, and is given numbers (In contrast to physical volume)), for example".

Summarizing, a virtual LUN (disclosed by Ito in Fig. 21, for example) read on a CDLUN.

As discussed above, Ito clearly discloses providing an Access Table that includes entries that each represents authorization of a particular remote entity to access a particular LUN; providing a Supplemental Access Table that includes entries that each represents authorization of a particular CDLUN to access a particular LUN; and when a remote entity requests execution of an operation directed to a specified CDLUN and involving one or more additional specified LUNs, authorizing the request for execution of the operation only when an entry currently exists in the Access Table that represents authorization of the remote entity to access the specified CDLUN and, for each of the one or more additional specified LUN, an entry exists in the Supplemental Access Table that represents authorization of the specified CDLUN to access the additional specified logical unit, as required by claims 1 and 6.

Thus, appellant's representative contesting the 35 USC § 102 (e) rejection validity is found non persuasive.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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